PROF. VIVIAN B. LEWES.

WE much regret to see the announcement that Prof. Vivian B. Lewes died on October 23, of pneumonia, at Mold, Flintshire, where he was to deliver one of a series of Gilchrist Lectures on explosives.

Prof. Lewes was born in 1852. His education was undertaken by his uncle, George Henry Lewes, the well-known author of the "History of Philosophy" and other works. On leaving University College School at the age of sixteen, he became assistant to Dr. F. S. Barff, and in 1870 to Prof. A. W. Williamson at University College. Later he worked under Dr. C. Graham at the Birkbeck Institute, and was appointed assistant at the Royal Naval College, Greenwich, in 1879, where he succeeded Dr. H. Debus as professor of chemistry in 1888, which post he resigned a year ago. He was appointed chief superintending gas examiner to the corporation of the City of London in 1892, and at the time of his death was chairman of the Chemical Section of the Munitions Inventions panel.

His chief scientific work was on the action of heat on hydrocarbons and the cause of luminosity of flames; papers on these subjects were published in the Proceedings of the Royal Society in 1893–1895. Lewes's acetylene theory of luminosity, whilst it has met with much criticism, has been accepted widely as the correct explanation of the main interactions giving rise to luminosity. He was also the author of papers on pentathionates.

When, in 1892, Willson, in Canada, first obtained calcium carbide on a commercial scale, a sample was forwarded to Lewes, who, at the Royal Society of Arts, in 1894, brought this substance under the notice of an English audience. Later he did much to establish the success of the new industry. No one, indeed, was more welcome or more certain of an appreciative audience at the Society of Arts, and there he delivered several series of Cantor and other courses of lectures, dealing with such subjects as coal gas, explosives, liquid fuel, etc.

As a lecturer under the Gilchrist Educational Trust he was most popular and widely known throughout the country. He was, indeed, the last of the original group of Gilchrist lecturers, the panel of which included many illustrious names.

Prof. Lewes did excellent pioneer work in connection with the University Extension lecture scheme and as a lecturer for the Technical Education Committee of the London County Council. This was the work largely of a past decade, but filled a most important place in our educational system. He laid claim justly to have instilled the desire for further chemical knowledge in numbers of young students, and contributed very greatly to the success of systematic chemistry courses in our numerous technical schools and institutions.

His connection with the Navy was naturally not without its influence on his researches, many of which formed the subject of communications to the Institution of Naval Architects (of which he was a vice-president). The institution awarded him its first gold medal for a paper on "The Formation of Boiler Incrustations and Oily Deposits." Other important papers were on the corrosion of metals, anti-fouling compositions, and the spontaneous ignition of coal.

Prof. Lewes's principal technical field, however, was in connection with coal gas. He was always a welcome lecturer at the Institute of Gas Engineers and other similar societies, before the members of which he dealt in a lucid manner with current problems affecting this important industry. He was the author of several books, including "Acetylene," which is a standard work of reference, "Service Chemistry," now in its fourth edition, "Liquid and Gaseous Fuel," and "The Carbonisation of Coal."

Prof. Lewes's genial personality, his kindly and generous nature, endeared him to a very wide circle, both of personal and professional friends. Among the large number of naval officers with whom his duties brought him in contact no one was more popular or more respected.

NOTES.

WE much regret to announce the death, on October 23, from heart failure following influenza, at fifty-one years of age, of Dr. R. Assheton, F.R.S., University lecturer in animal embryology at Cambridge since 1911.

WE regret to announce that Sir Andrew Noble, Bart., K.C.B., F.R.S., to whose scientific work on artillery and explosives the marvellous developments of heavy weapons within the last fifty years are chiefly due, died on October 22, at eighty-four years of age.

MR. W. MARRIOTT has retired from the post of assistant secretary of the Royal Meteorological Society held by him for the last forty years, and has been succeeded by Mr. A. H. Brown, the chief clerk of the society.

MR. W. K. CARR, the owner of one of the best-equipped private laboratories in the United States, died recently at his home in Washington, at the age of fifty-five. On leaving the University of Virginia in 1878, he spent twelve years in the sale and manufacture of cotton at Norfolk, Va. Since then he had devoted most of his time to scientific research.

THE death is announced, in his sixty-fifth year, of Mr. C. F. Holder, of Pasadena, the writer of a large number of books on the natural history of southern California. He was educated at the Friends' School, Providence, R.I., and at the United States Naval Academy. For a few years he was an assistant at the American Museum of Natural History, New York. Mr. Holder's special interests were in marine zoology.

THE first meeting of the new session of the Geological Society will be held on Wednesday next, November 3, at 5.30 p.m., when Dr. C. W. Andrews will exhibit photographs and give an account of the discovery of a fossil elephant at Chatham. Owing to the possibility of air-raids over the metropolis, and the consequent disorganisation of traffic, the council has decided that the time of the evening meetings shall be changed temporarily from 8 p.m. to 5.30 p.m.

WE regret to record the death of Lieut. J. Gordon Hollingsworth, of the 10th Battalion of the Middlesex Regiment, who was killed in the Gallipoli Peninsula on August 12. He was the second and only surviving son of Mr. A. T. Hollingsworth, one of the managing directors of *Engineering*. He was reported "missing" some weeks ago, and it was only on October 15 that official announcement was made that he fell gallantly leading his men in an advance which took place soon after the landing at Sulva Bay. He was educated as an engineer, and joined the staff of our contemporary, being later elected a director of *Engineering*, Ltd.

IN a review of Dr. E. Hindle's book on "Flies in Relation to Disease," published in *Science* for July 16, the remark was made that the author had been killed in Africa. Referring to this statement, Prof. G. H. F. Nuttall writes from Cambridge:—"Dr. Hindle has never been in Africa, and he is alive and well. He is expecting to leave for the front at any moment as a divisional signal officer in the R.E. I shall be much obliged to you if you will help me to make the facts known, as the statement in *Science* has caused unnecessary pain to Dr. Hindle's friends in many parts of the world."

A CORRESPONDENT, writing from Amsterdam in the *Times* of October 22, contributes incidentally some interesting observations on the effects of distant gun-firing. "At more than one point in the southern frontier" of Holland, he says, "one hears the guns from the French front," the distance being about a hundred miles. "It is difficult to say whether one really hears them with one's ears or whether one feels them. It is not, at this distance, a definite sound so much as a jarring and throbbing of the air. But it is audible, or sensible, enough that one can pick out the detonations of pieces of different calibre, the almost continuous low muttering (for heavy work was going on) of the smaller guns being punctuated at intervals with the double shock of something much bigger."

AT the annual statutory meeting of the Royal Society of Edinburgh on October 25 the following were elected as council:—*President*: Dr. J. Horne; *Vice-Presidents*: Prof. F. O. Bower, Sir T. R. Fraser, Dr. B. N. Peach, Sir E. A. Schäfer, the Right Hon. Sir J. H. A. Macdonald, and Prof. R. A. Sampson; *General Secretary*: Dr. Cargill G. Knott; *Secretaries to Ordinary Meetings*: Dr. R. Kidston and Prof. A. Robinson; *Treasurer*: Mr. J. Currie; *Curator of Library and Museum*: Dr. J. S. Black; *Councillors*: Principal A. P. Laurie, Prof. J. Graham Kerr, Dr. L. Dobbin, Dr. E. M. Wedderburn, Dr. W. B. Blaikie, Principal O. C. Bradley, Dr. R. S. MacDougall, Dr. W. A. Tait, Dr. J. H. Ashworth, Prof. C. G. Barkla, Prof. C. R. Marshall, Principal A. Crichton Mitchell. Sir William Turner, former president, is a permanent member of council.

IN addition to the awards announced in April for papers read at the meetings, the council of the Institution of Civil Engineers has made the following awards for papers published in the Proceedings without discussion during the session 1914–15:—A Telford gold medal to Mr. James Forgie (New York); Telford premiums to Messrs. J. R. Mason (Dunedin, N.Z.), Harold Berridge (Aden), C. R. White (London), C. S. Churchill (Roanoke, Va.); and the Trevithick premium to Mr. A. Poulsen (Lemvig, Denmark). The Indian premium for 1915 has been awarded to Mr. C. W. Anderson (Midnapore, India). The ninety-seventh session of the Institution will be opened on Tuesday, November 2, at 8 p.m., when Mr. Alexander Ross, president, will deliver an address, and will present awards made by the council for papers read and discussed or otherwise dealt with during the past session.

A MEETING of the National Illumination Committee of Great Britain was held on October 20, when Mr. W. Duddell was elected chairman of the committee in succession to the late Mr. Edward Allen. Reports on observations carried out at the instance of the committee at a number of technical laboratories, on the height to which the flame of the Hefner amylacetate lamp should be raised to afford a light of one international or English standard candle, were discussed, and their further consideration was postponed until fuller details of some of the observations and other reports which had been promised had been obtained. A report prepared and sent by Dr. E. Ott, of Zürich, on researches which had been carried out in Switzerland on the effect of atmospheric pressure, humidity, and vitiation on the light afforded by the Hefner standard lamp was considered, and it was decided, subject to Dr. Ott's consent being obtained, to prepare a translation of the report for communication to the British technical Press.

THE *Mining Magazine* of October 14 contains an article on weights and measures dealing in a practical manner with the question of the necessity for some reform in our present system. The substitution of the metric system is advocated, but more from the point of view of the technical man than from that of the general trading community. It is pointed out that the modifications which the adoption of the metric system would introduce in mining and metallurgical work are not such as to cause any inconvenience, while on the other hand the confusion which at present exists owing to the various tons, gallons, etc., recognised in the mining profession would be entirely obviated. It is also suggested that if the adoption of the metric system is regarded as too revolutionary for the English-speaking nations, or if the present is not a suitable time for conducting an agitation in its favour, some steps can at least be taken by technical men towards simplifying the British system and agreeing upon a common usage. Various examples are given with the object of illustrating the need for a less complicated and more practical system. The general adoption of the short ton, which is much used in mining circles for recording ore mined or developed, is strongly advocated. Engineers are advised to use the metric system wherever possible, and always to champion it; to use the simplest of English weights and measures and in cases of uncertainty to specify the unit; and further, to avoid, when addressing an English audience, the use of denominations of weights and measures not likely to be understood.

THE civil engineering profession, and especially that section of it connected with river training and coastal defence work, will learn with regret of the death, at the age of eighty-three, of Mr. W. H. Wheeler, formerly of Boston, Lincs, but latterly residing at Bromley, Kent. He practised for many years in the district bordering on the Wash, and became an authority on the drainage of fens and low lands, and the regulation of estuary channels, as also on coastal phenomena generally. His "History of the Fens of South Lincolnshire" is, perhaps, his best known work; it was first published in 1868, and was reissued as a second edition in 1897. Other volumes which followed were "Tidal Rivers: their Hydraulics, Improvement, and Navigation," in Longmans's Civil Engineering Series, 1893; "The Sea Coast: (1) Destruction, (2) Littoral Drift, and (3) Protection," 1902; a "Practical Manual on Tides and Waves," 1906; and "The North Sea: Physical Characteristics, Tides, Currents, and Fishery," 1908. His pen was very prolific, and he contributed a great number of papers to professional societies and articles to technical journals, as well as to our own columns, all bearing on the branch of work which he had made peculiarly his own, and on which, despite inevitable occasional divergences of opinion from professional colleagues on controversial matters, he was ever listened to with attention and respect. He was elected a member of the Institution of Civil Engineers in 1867, and was the recipient of a Telford premium from that body.

A FEW further particulars are available as to the recent long-distance tests in wireless telephony in the United States to which reference was made in NATURE of October 7 (p. 155), but no data have yet been disclosed concerning the type of apparatus employed in the tests. The transmitting apparatus was installed in the U.S. Government wireless station at Arlington, while receiving sets only were used at Mare Island and Pearl Harbour stations. The distance between Arlington and Mare Island is about 2500 miles, and between Arlington and Pearl Harbour 4900 miles. The conversation was overheard at several points, including Darien, Panama, a distance of more than 2000 miles from the transmitting station. The tests are the outcome of many years of painstaking experiments. Early in the spring of this year the system had been developed up to a point where good results were secured over a distance of 250 miles, employing for the aerial an experimental tower erected at Montauk Point, Long Island, and a small tower at Wilmington, Del. This was followed by tests between Montauk Point and St. Simons Island, Ga., a distance of 1000 miles. No novel features are claimed for the system, which is said to be simply the perfection of existing methods. Further and extended trials under varying conditions are necessary, however, before we can state with tolerable certainty whether the problem of long-distance wireless telephony has been satisfactorily solved.

THE Trustees of the National Museum, Melbourne, have issued a second and revised edition of the "Guide to the Ethnological Collections," compiled by Dr. Baldwin Spencer. The older specimens are largely due to Mr. Brough Smith, but they have been largely increased by those made by Dr. Spencer and the late Mr. Gillen in the course of their famous journeys among the Arunta and other tribes. A short introduction gives the latest views on the ethnology of the continent. Specially remarkable are the rare specimens illustrating religious usages, totemism, initiation ceremonies, and the like. The handbook, which is well illustrated, will be indispensable to all students of the Australian aborigines.

MR. MORTEN P. PORSILD, writing from Disco, Greenland, has published a valuable monograph entitled "Studies on the Material Culture of the Eskimo in West Greenland." He adopts the scientific method of discussing in the case of each implement the object aimed at in its construction; the mode of use in order to attain this object; how its form is adapted to its use; how far the nature of the material has influenced its form. He points out that the study of Eskimo culture is specially useful for comparison with that of the European Stone Age people. He concludes that this culture developed in the Arctic area without any borrowing from foreign civilisations, except in the case of the bow and arrow. He finds that the types of the kayak have a regional distribution similar to that of the Greenland dialects. Many implements are for the first time described, and these notes serve to modify certain current theories. He warns museum collectors against the purchase of so-called "models," and he remarks that though faked antiquities are very rare, yet they may be sometimes met with.

OF pelagic Annelids, the Alciopidæ and the Tomopteridæ, not a single species has hitherto been obtained from Japanese waters. Mr. Akira Izuka is therefore to be congratulated on having, in the course of his researches, brought to light no fewer than nine species belonging to these families. Three of the species thereof are new to science. He describes his captures in the Journal of the College of Science of the Imperial University of Tokio (vol. xxxvi., art. 5).

ACCORDING to Dr. J. H. Vernhout, in the July issue of *Zoologische Mededeelingen* (the organ of the Natural History Museum of Leyden), the parasitic *Petricola pholadiformis*, one of the "Venus-shells," recently introduced into British waters with American oysters, has also appeared on the Dutch coast. In addition to cases he has already recorded he now adds to this list Flushing, Isle of Walcheren, eastern Schelde, Zandvoort, and Terschelling. The introduction of American oysters into British waters has not proved an unmixed blessing. For another parasitic mollusc, *Crepidula fornicata*, the "slipper-limpet," one of the Capulidæ, introduced inadvertently into the Whitstable oyster-beds has now become a pest. Furthermore, it is slowly spreading round the coast.

Among the factors of elimination in the "struggle for existence," one does not usually reckon hot springs. Yet these, too, play their part. This much is apparent from the Bulletin of the University of Colorado (vol. xv., No. 6), wherein Messrs. Ellis and Henderson give an account of the Amphibia and Reptilia of Colorado. In the hot springs near Buena Vista, at an elevation of 8500 ft., they found larvæ of the Columbian toad (*Bufo boreas*) in an overflow pool at 23° C. Following the stream back, toward the spring, the temperature of the water increased rapidly, but the young toads continued abundant until the water was at 34° C. Above this point few were seen, though one small specimen was taken from water at 45° C. This toad was swimming rapidly, as if endeavouring to reach cooler water. The pools of very hot water, they remark, were death-traps for *Bufo boreas,* and numerous other animals. From one such pool, the water of which was 54° C., three large specimens of this toad and several insects were taken, the flesh of all of them being thoroughly cooked. A list of animals and plants described as new, and a key to the Entomostraca of Colorado, make up the rest of this bulletin.

In the issue of *Knowledge* for September there is a short paper on the hairs of rock plants by K. E. Styan, with illustrations. The glandular hairs of the Saxifrages are described, and those of *S. granulata* and *S. lingulata* are figured. The three types of hairs dealt with are the silky or woolly hairs of the Edelweiss, *Sedum arachnoideum,* etc.; the stellate hairs which form a felted covering to many leaves, as in Aubretias and Alyssums, and the glandular, which may occur alone or in conjunction with one of the other types. The hairs are mainly protective against atmospheric conditions, but the glandular hairs may in some cases serve to attract insects.

A botanical survey of some fields near Leicester is a useful contribution to field botany by Miss Measham, published in the Transactions of the Leicester Literary and Philosophical Society, vol. xix. The fields are mapped, and from a study of the grasses in particular it was found possible to group certain fields together according to their types of vegetation. Fields, for instance, characterised by *Lolium perenne* form one group, while those with *Rhinanthus crista-galli* in abundance are taken as the type of another group. As a preparation for a flora of Leicestershire and Rutland, the work should prove of value.

The Transactions of the Botanical Society of Edinburgh (vol. xxvi., part iv.) are largely occupied by an important paper on *Primula obconica,* Hance, and its microforms by Prof. Bayley Balfour. The paper is illustrated by thirty-six plates reproduced from photographs of herbarium specimens. The familiar plant *P. obconica* was collected near Ichang in 1879, and was raised from seed sent by Charles Maries to Messrs. Veitch, of Chelsea, in 1880. The type-plant grows in meadow land, but many of its forms grow on rocks in the limestone gorges. The species is widely distributed in eastern Asia, and extends into Burmah and Bhutan, *P. listeri,* King, the East Himalayan species, is mainly a sylvestral form with ivy-shaped leaves and short flower-scapes, but is linked up to the typical round-leaved *P. obconica,* with its longer flower-scapes, by a series of intermediate forms. The variants are nearer to the *obconica* type than to *listeri.* Prof. Balfour places in this Obconico-Listeri section fourteen well-marked micro-species, four of which are of his own making. *P. sino-listeri,* a glabiescent form with acute-lobed small leaves and long scapes, was collected recently by Forrest in Yunnan, and may prove to be a plant of horticultural value. It lacks the irritant property of *P. obconica,* Hance.

The Report of the Agricultural Department of St. Lucia for the year 1914–15 is a record of steady progress, especially in connection with the lime and coconut industries. The Government lime juice factory proves to be in a flourishing condition, and products of a high quality are being prepared, of which details are given. Useful work is being done by the staff of the department in collecting the grasses of the island, both native and naturalised, with a view to their correct determination and also in order to obtain definite particulars of their economic value. The determinations of those unknown locally have been made by Mr. Hitchcock, the agrostologist to the U.S. Department of Agriculture, and useful notes are given on the more important grasses and an analysis to show their comparative feeding value.

A relief model of Wales has been constructed for the National Museum, Cardiff. An account of its construction, with a geographical description of several of the blocks, has been published by the museum ("Descriptive Handbook to the Relief Model of Wales," by W. E. Whitehouse). The whole model measures 12 ft. by 10 ft. 6 in., and is on a scale of 1 in. to a mile. The vertical scale is 1 in. to 2000 ft. The museum hopes shortly to issue copies of the various blocks of the model at as low a price as possible. Despite the care that has undoubtedly been used in its construction, it is questionable whether such a model is not inferior for teaching purposes to a good contoured map on the same scale. In accuracy of detail there can be no comparison.

News from Sir Aurel Stein of his explorations in Central Asia is published in the *Geographical Journal* for October (vol. xlvi., No. 4). A despatch from the Ulughart Valley dated July 10, 1915, gives an account of last winter's work in the Turfan region, which included a detailed survey of the Turfan depression and of the Kuruk-tagh mountains. The Kuruk-tagh and the Tian-shan range were linked to the trigonometrical survey of India. From Turfan Sir Aurel Stein moved to Korla in the spring, and thence to Kashgar. Large and important archæological collections were made. In a further despatch from "Camp Kara-Chem," Pamirs, August 8, 1915, Sir Aurel Stein says he is proceeding westward to the Pamir source of the Oxus. This he proposes to follow through Wakhan to Khorok, and thence to visit Roshan, Darwaz, Karategin, and so to reach the railway at Bokhara. He hopes to reach Meshed in Persia in October, and after spending the winter in Seistan, to return to India in March.

THE number and variety of the fossil reptiles and amphibians discovered in the Karoo formation of South Africa are very remarkable. Several new genera and species are described by Mr. S. H. Haughton in the Annals of the South African Museum, vol. xii., part iii., just received. Besides a well-preserved Labyrinthodont skeleton and various remains of the usual mammal-like reptiles, there is an interesting skull from the Stormberg Beds bearing much resemblance to that of Ornithosuchus from the Triassic sandstones of Elgin, Scotland.

PART of the lower jaw of a hoofed mammal with teeth like those of the peculiar extinct hoofed mammals of South America has been found in the Lower Eocene of Wyoming, U.S.A., and is described under the name of Arctostylops by Dr. W. D. Matthew in the Bulletin of the American Museum of Natural History, vol. xxxiv., art. xiv. This unexpected discovery suggests that at the beginning of the Tertiary epoch there may have been a longer and closer connection between South and North America than has hitherto been supposed. Numerous other jaws from the same formation and locality in Wyoming are referred by Dr. Matthew to primitive lemurs and insectivores. They show that at the beginning of the Eocene period the lemurs, insectivores, and carnivores cannot be clearly distinguished by the teeth alone.

A BOUND volume of "Papers from the Geological Department, Glasgow University," for 1914, has been issued by Messrs. J. Maclehose and Sons, Glasgow, with the sanction of the University Court. It is proposed to continue this publication annually. The present volume consists of reprints, of differing sizes, of papers published in various journals, some of which have been already noticed in NATURE. It remains to be seen whether a paper will be more readily traced by this mode of reproduction than in its original habitat. If the work relating to the Glasgow district were thus brought together, a new serial might be welcome; but it may be doubted if researches on South Georgia or the desiccation of the earth will be looked for under the head of the University of Glasgow. The volume is a further proof of the activity of what has become, under Prof. J. W. Gregory's influence, one of the chief schools of geology in our islands.

THE Proceedings of the American Philosophical Society for July contains an important article by Prof. A. E. Kennelley and Mr. H. O. Taylor, of Harvard University, on the extent to which the various portions of a telephone diaphragm move during vibration. The diaphragms were circular, of about 5 cm. diameter, of steel or glass, and clamped at the outer edge. The motion was observed by means of a triangular mirror of a millimetre side, one corner of which was pressed lightly against the diaphragm by the torsion of a thin phosphor-bronze strip to which the opposite side of the mirror was attached. The diaphragm was set into vibration either by the sound waves from a series of organ pipes or by alternating electric currents sent round an electromagnet behind it. In almost all cases within the telephonic range of intensity and frequency the diaphragms vibrated in their fundamental mode with the maximum displacement at or near the centre; and the law of distribution of displacement over the rest of the surface closely approximating to the theory as given by Lord Rayleigh in his "Theory of Sound."

THE *Scientific American* for October 2 contains an article on "America as her Own Chemist," giving an account of the first National Exposition of Chemical Industries, which was held in the Grand Central Palace of New York City during the week of September 20. It is stated that this exhibition illustrates in a very striking manner the remarkable advance made in the production of chemicals and dyes in the United States since Germany has been commercially isolated and prevented from exporting. The exhibition included three branches: first, chemicals, ores, metals, drugs, paints, and similar manufactured goods; secondly, apparatus and equipment for chemical laboratories; and, thirdly, machinery and equipment for manufacturing chemists, the treatment of ores, etc. Some of the most striking examples of progress were to be found in the exhibits illustrating the utilisation of waste cherry pips, raisin seeds, and apricot kernels; the application of the osage orange wood of Texas and Oklahoma in place of foreign fustic, and the production of useful products of distillation from different hardwoods. The Petrocine colours, now being manufactured from waste products of petroleum, which are being investigated by the Bureau of Foreign and Domestic Commerce, formed a striking example of new adaptations. The exhibit of the Bureau of Standards was a prominent feature of the exhibition, not only in presenting the apparatus used in the laboratories of the bureau, but also examples of chemicals, metals, ores, and materials recently tested.

AN important study of the quality of platinum ware by Messrs. G. K. Burgess and P. D. Sale is found in No. 254 of the Scientific Papers of the United States Bureau of Standards. A simple thermo-electric method has been devised to determine the degree of purity of the platinum used in platinum vessels which does not mar the article tested; it gives data for the classification of platinum in terms of its equivalent iridium (or rhodium) content. Of 164 pieces of platinum ware tested, 26 per cent. contained less than 0·5 per cent. of iridium and 67 per cent. less than 2 per cent. of this metal. A method is described of ascertaining the loss on heating of platinum crucibles by means of a suitable electric furnace containing no heated metal parts. The loss of weight due to heating per 100 sq. cm. of crucible surface at 1200° ranged from 0·71 mgrm. to 2·69 mgrm. per hour, the smaller losses being for crucibles containing rhodium and the greater losses for crucibles containing iridium. Iron appears to diminish the loss on heating, but its presence is objectionable on account of the soluble oxide formed on the crucible surface. It seems to be possible from a thermo-electric and microscopic examination of a crucible to predict its probable loss of weight on heating within fairly close limits. Suggestions are offered concerning specifications of quality for the highest grade of platinum ware, including the substitution of rhodium for iridium as a stiffening agent, and the total elimination of iron. The nature of the disintegration of platinum and its alloys is briefly discussed.

THE announcements of Messrs. Crosby Lockwood and Son include:—A translation of Prof. Klingenberg's Large Electric Power Stations, illustrated; Oil-Field Development, by A. Beeby Thompson; Air Screws: an Analytical Study in the Application of the Analogy of an Aerofoil having a Rectilinear Motion, by M. A. S. Riach; and new editions of Naval Architect's and Shipbuilder's Pocket Book of Formulæ, Rules, and Tables (with a section on Aeronautics), by C. Mackrow and L. Woollard; Mechanical Handling of Material, by G. F. Zimmer.

MESSRS. GEORGE ALLEN AND UNWIN, LTD., will publish shortly:—Table of Compound Interest and Antilogarithms, by J. J. Stuckey, and a translation, by Dr. E. L. Schaub, of Prof. W. Wundt's Elements of Folk Psychology: Outlines of a Psychological History of the Development of Mankind.

OUR ASTRONOMICAL COLUMN.

THE GREAT METEOR OF OCTOBER 5.—A large number of descriptions of this object has reached Mr. W. F. Denning as the result of an appeal for observations published in some of the leading journals of the west of England. Mr. Denning sends us the following summary of the observations:—The meteor appears to have been widely seen over the S.W. region of England, and there were many observers in South Wales. Most of the spectators first saw a brilliant illumination of the sky and landscape, and, looking up to ascertain the cause, the end of the meteor or the luminous streak it left was at once perceived. To many of the observers in Cornwall and Devon the position of the object was in the N. by E. sky, and the streak remained visible for periods varying between two and twenty minutes.

The light evolved from the fireball at the instant of its greatest outburst is said to have exceeded that of the full moon, but there are not many really accurate accounts of its path amongst the stars. At first the streak was projected like a glowing bar among the stars between the pointers in Ursa Major and the Pole star, but it quickly became contorted and curled up, either into a ring with appendages or into an irregular ellipse, expanding as time went on, and becoming fainter.

Using many of the best observations of the meteor for comparison, the height seems to have been from 82 to 55 miles from over Lampeter to Neath, South Wales. The length of the visible course was about 42 miles, and velocity about 35 miles per second. Radiant at 248°+72°; but this feature is rather doubtful, and it is hoped that further observations of the flight may yet be acquired so that the position may be tested. The eastern side of the streak expanded so quickly and with a motion decidedly eastwards that its velocity must have been equivalent to about 90 miles per hour.

PROPER MOTIONS MEASURED BY THE BLINK-MICROSCOPE.—There can be no doubt that stereoscopic or quasi-stereoscopic methods are destined to become of very great importance in astronomical work. Thus at the Lowell Observatory, Lampland has employed Pulfrich's device, the blink-microscope, for detecting variables and asteroids; at Yerkes, Slocum has shown that it is equally well adapted for finding proper motions, and the instrument has been enthusiastically adopted at the Union Observatory, Johannesburg. The director, Mr. R. T. A. Innes, can even see this instrument with standard transparent charts replacing the unwieldy durchmusterung catalogues. Already many variable stars have been discovered by its use, asteroids have been successfully picked up, and a good beginning has now been made in its application to the question of proper motions. In Circular No. 25, Union Observatory, Mr. Innes and Mr. J. Vôute, an assistant from the Leyden Observatory, who has been working at the Cape, both describe methods by which the proper motions of a number of stars in the great ω Centauri cluster have been measured. The former not only *detects*, but also *measures* the displacements with the "blink," whilst Mr. Vôute only uses it to make the selection, and then proceeds to take differential micrometric measures. The plates employed (astrographic) had been taken separated by an interval of 23·85 years. Of the 2000 stars on the plate, 30 presented measurable displacements (motions exceeding an annual value of 0·04″–0·06″), whilst for fifty others the indications were doubtful.

THE LIGHT-CURVE OF XX CYGNI.—Several recently published papers concerning stellar variability have possessed somewhat exceptional attraction, not only in the variety of methods exemplified, but chiefly in consequence of the notable astrophysical importance of the stellar bodies investigated. Another such memoir appears in the September number of the *Astrophysical Journal,* Dr. Harlow Shapley and Martha B. Shapley presenting an account of the employment of the latest methods of photographic actinometry in the study of the light curve of XX Cygni. Previous work indicated that this star was to be regarded as an abnormal Cepheid variable, exceptional not only by reason of its short period—the most rapid known—but also because it had been shown by Kron to present a greater amplitude of light-change visually than photographically. Employing the Mount Wilson 60-in. refractor on four nights, upwards of 300 photographs of the star on ordinary plates alternately with isochromatic plates with yellow screen were secured, providing the material for a photographic and photovisual investigation of its fluctuating light. The results obtained show that the shape of the mean light-curve, and also its range, are both variable. The visual range does not exceed the photographic but apparently is somewhat smaller. It is concluded that the maxima, although occurring at regular intervals, are disturbances varying in character, the minimum being the sensibly constant condition of the star. The value of the colour index indicates an average spectrum of the F type rather than A as classified at Harvard.

ATMOSPHERIC EFFECTS OF KATHODE RAYS.—M. J. Maurer, of the Central Meteorological Bureau, Zurich, describes (No. 4813, *Astronomische Nachrichten*) for the first time what is possibly an atmospheric effect due to solar kathode rays. Having formed the opinion that times of exceptional solar activity would be especially favourable for decisive observations of a long-suspected phenomenon, arrangements were accordingly made with Prof. Wolfer, who supplied information regarding the rapid development of solar activity about the middle of last June. The result was that between 2 and 3 p.m. on June 16, with a blue sky, in addition to the water-vapour halo of 70°, there was also observed a distinct brown aureole having a maximum breadth of about 15°. Prof. Wolfer also noted that some optical effect, comparable with the interposition of a slight veil of vapour, had interfered with his solar observations. It is further pointed out that Prof. Barnard recorded an auroral display on the night of June 16.